

# Work Order ID 50705

July 21, 2009 10:18:05 AM

Page 1

Item ID: D212-664-107TRN

Accept

Revision ID: A

Item Name: Crosstube Turning Detail

Start Date: 07/21/2009 Start Qty: 1.00

Required Date: 07/31/2009 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan: *MF*

Date: *09-07-21*

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D212-664-147

Rev. A

100

0.00



MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA705  
2-Turn first side as per Folio FA113  
3-File down transition lines smooth.

*a.m. 09 - 08 - 18*

110

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

*a.m. 09 - 08 - 18*

120

0.00



MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA705  
2-File down transition lines smooth.  
3- Remove plugs and sand

*a.m. 09 - 08 - 18*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**Work Order ID 50705**

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Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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130

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

Q.A. 09-06-18 ①

140

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

Quality Control

⇒ 808/05/18

①

①

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Q.A. 09-08-19 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Work Order ID 50705

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Page 3

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Item Name: Crosstube Turning Detail

Start Date: 07/21/2009 Start Qty: 1.00

Required Date: 07/31/2009 Req'd Qty: 1.00

Cust Item ID:

Customer:




Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160  QC Quality Control	QC3- Inspect Part Finish  Memo	0.00  0.00				<u>D</u>		<u>81 9/8/19</u>	
170  Packaging Packaging	Packaging  Memo Identify and stock in kanban rack <input type="checkbox"/> Location: <u>2A</u>	0.00  0.00				<u>0.00</u>	<u>0.00</u>	<u>08-08-19</u>	<u>⑦</u>
180  QC Quality Control	QC21- Final Inspection - Work Order Release  Memo	0.00  0.00						<u>09/08/19</u>	<u>JJ</u>

MF  
09-08-19

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

July 21, 2009 10:18:05 AM

Page 1

Work Order ID: 50705



Parent Item: D212-664-107TRNRevA



Parent Item Name: Crosstube Turning Detail

Start Date: 07/21/2009

Required Date: 07/31/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D6019-128RevA		Manufactured	No			110	Each	22.0000	1.0000			



0.1 09.08.18

Crosstube Material

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

22

29369

7

32310

15

\_\_\_\_\_  
\_\_\_\_\_  
1

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



<b>DART AEROSPACE LTD</b>	<b>Work Order:</b> 50705
<b>Description:</b> Crosstube Assembly (205/212/412 Low Fwd)	<b>Part Number:</b> D212-664-147
<b>Inspection Dwg:</b> D212-664-147 Rev: A	<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.313	+/-0.010	0.313	/		
	2.360	+0.005/-0.000	2.363	/		
	2.360	+0.005/-0.000	2.362	/		
	2.366	+0.005/-0.000	2.368	/		
	2.473	+0.005/-0.000	2.477	/		
	2.573	+0.005/-0.000	2.576	/		
	2.673	+0.005/-0.000	2.676	/		
	2.750	+0.005/-0.000	2.750	/		
	2.750	+0.005/-0.000	2.750	/		
SIDE B	0.313	+/-0.010	0.313	/		
	2.360	+0.005/-0.000	2.363	/		
	2.360	+0.005/-0.000	2.362	/		
	2.366	+0.005/-0.000	2.368	/		
	2.473	+0.005/-0.000	2.477	/		
	2.573	+0.005/-0.000	2.576	/		
	2.673	+0.005/-0.000	2.676	/		
	2.750	+0.005/-0.000	2.750	/		
	2.750	+0.005/-0.000	2.750	/		
	0.126.53	+/-0.020	126.550	/		

<b>Measured by:</b> G.M	<b>Audited by:</b> S	<b>Prototype Approval:</b> N/A
<b>Date:</b> 09.08.18	<b>Date:</b> 09.08.18	<b>Date:</b> N/A

<b>Rev</b>	<b>Date</b>	<b>Change</b>	<b>Revised by</b>	<b>Approved</b>
A	08.11.07	New Issue (P/O D212-664-107)	KJ/EC	

**PARTS LIST:**

Qty	Part Number	Description
X	D212-664-147	CROSSTUBE ASSEMBLY (205/212/412 LOW FWD)
1	D6019-128	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
2	D3659-1	CUFF
4	MS21920-25	CLAMP (OR MS21920-26)
44	CR3212-4-06	RIVET (OR M7885/3-4-06)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

**GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6019-128  
FINISHED LENGTH = 126.53±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY,  
TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE  
TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER ON INNER SURFACE OF TUBE WITH A  
VIBRATING STYLUS.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS  
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT  
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1  
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER  
INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE  
D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE  
CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY  
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3659-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A  
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN  
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

#50705  
MP 09-07-25

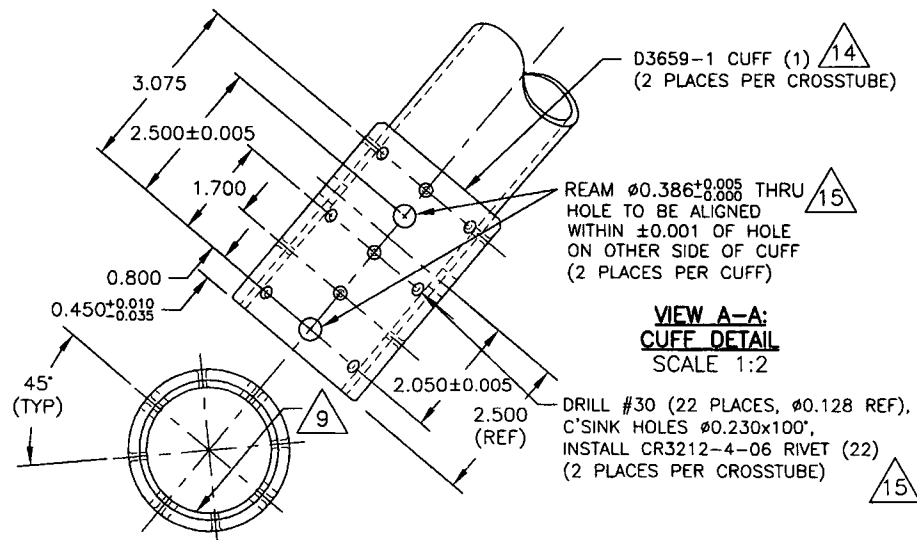
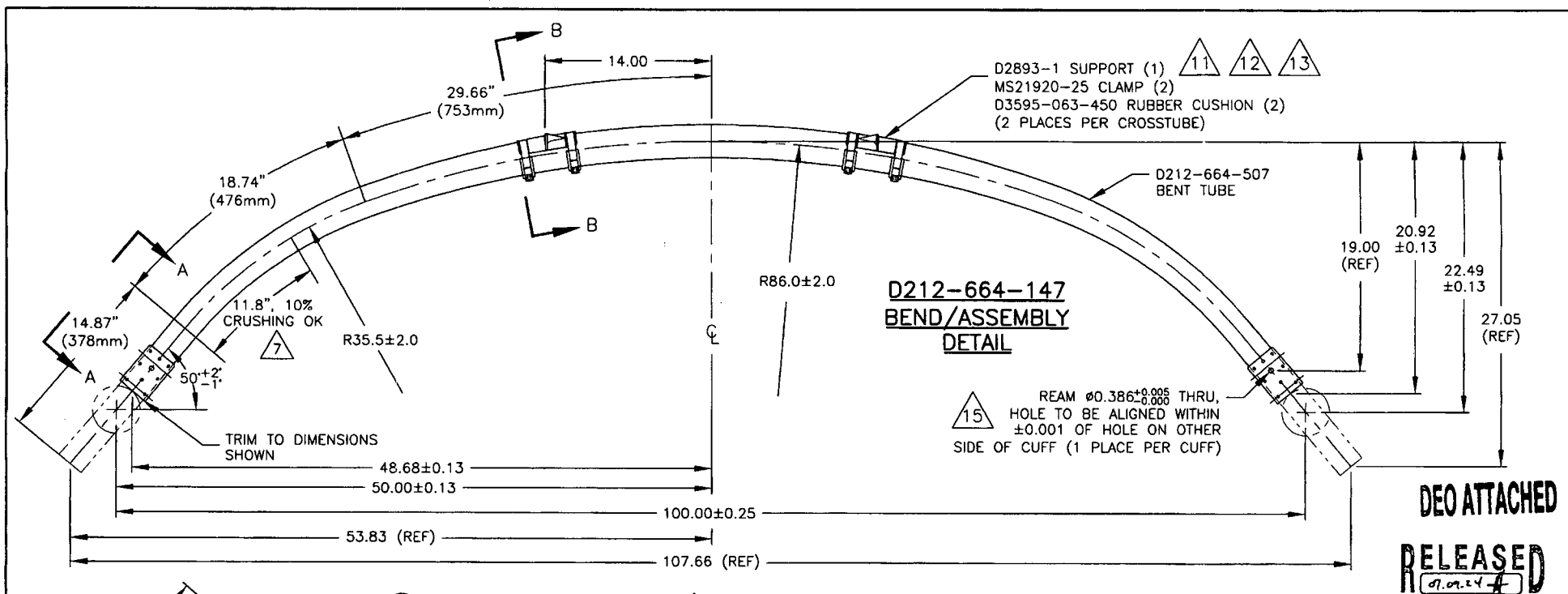
DEO ATTACHED

RELEASED  
01.09.24

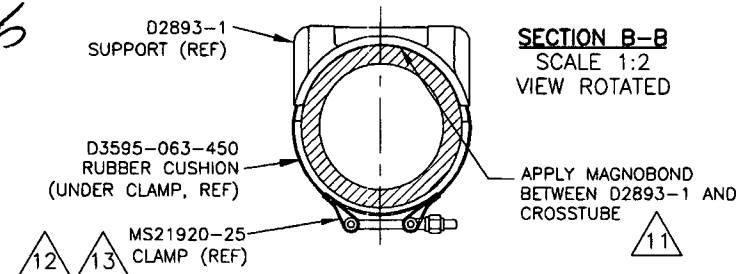
A		07.07.07	NEW ISSUE
DESIGN		DRAWN BY	<b>DART</b> DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO.	REV. A
DATE		D212-664-147	SHEET 1 OF 3
07.07.07		TITLE	SCALE
		CROSSTUBE (205/212/412 LOW FWD) NTS	

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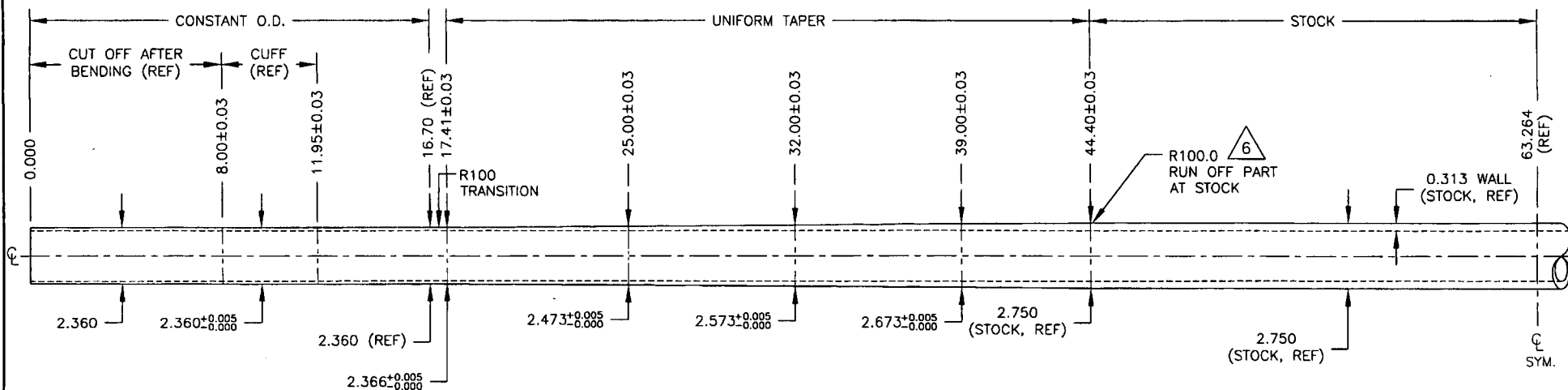
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		DATE		D212-664-147	SHEET 2 OF 3
		07.07.07		TITLE	SCALE
				CROSSTUBE (205/212/412 LOW FWD)	1:8



# D212-664-147 MACHINING DETAIL

RELEASED  
9.09.24

DEO ATTACHED

50705

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DATE 07.07.07		TITLE CROSSTUBE (205/212/412 LOW FWD)			SCALE 1:4

DRAWING NO. D212-664-147	TITLE CROSSTUBE	REV. A	<b>DART AEROSPACE LTD ENGINEERING ORDER</b>	D.E.O. NO. D212-664-147-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>JD</i>	CHECKED <i>PA</i>	MFG. APPR. <i>RE</i>	APPROVED <i>MD</i>	DE APPR. <i>TH</i>		
DATE 09.05.01	DATE 09.06.15	DATE 09.06.15	DATE 09/06/16	DATE 09/06/16		

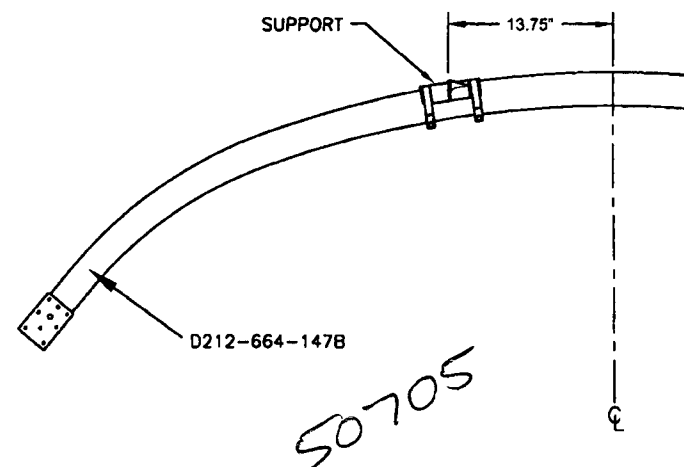
**CHANGE:**

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D212-664-147B	CROSSTUBE ASSEMBLY (214 LOW FWD)

THE D212-664-147B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-147 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-147 CROSSTUBE.

**RELEASED**  
*09/06/22*



**FIGURE 1 - SUPPORT INSTALLATION**

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